

RECEIVED

Before the
FEDERAL COMMUNICATIONS COMMISSION MAY 28 1993
Washington, DC 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the matter of)
Replacement of Part 90)
by Part 88 to Revise the)
Private Land Mobile)
Radio Services and)
Modify the Policies)
Governing Them)

PR Docket No. 92-235

COMMENTS OF CYCOMM CORPORATION

May 28, 1993

Richard L. McElhenie
Vice President
Cycomm Corporation
12150 Monument Drive
Suite 340
Fairfax, VA 22033

No. of Copies rec'd
List A B C D E

049

SUMMARY

Cycomm Corporation (Cycomm) enthusiastically supports the Federal Communications Commission (FCC) in its objectives in the above referenced proposed rule making. Adoption of this rule making would change the fundamental technology applied to the Private Radio Services below 512 MHz. It would require systems to be better matched to the desired service area, consolidate the radio services categories much as they are consolidated above 470 MHz, provide for exclusive operation, simplify the administrative burden imposed by the associated spectrum management issues and provide incentives for early adoption of new technology.

Cycomm believes these changes are necessary to the continued health of the land mobile industry and to the utility of two way dispatch radio services as a valuable tool to American industry.

Cycomm has focused its comments on its desire for technical flexibility, on the capability and availability of very narrow band technology, and on the need in the major cities for a rapid, one step transition plan.

TABLE OF CONTENTS

Summary.....	page i
Table of Contents.....	page ii
Cycomm Corporation Qualifications.....	page 1
Flexibility is Essential to Users and Manufacturers.....	page 2
Incentives will Improve Spectrum Efficiency Sooner.....	page 4
Spectrum Efficiency Is Not an Enemy of Economic Efficiency.....	page 5
Some Users Need Spectrum Efficiency Now.....	page 6

Very Narrow Band Technology is Essential page 8

RECEIVED

MAY 28 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Cycomm Corporation Qualifications

1. Cycomm Corporation (Cycomm) is a US corporation headquartered in Portland, Oregon. Cycomm is a leading manufacturer of cellular and two way radio and telephone voice and data privacy and security products, and sells its products internationally.

2. Recently, due to its significant involvement in the application of leading edge technology to privacy and encryption, Cycomm has been investigating the modulation methods and underlying efficiencies in private land mobile radio. Cycomm has been encouraged by the joint effort of representatives from industry and the federal, state and local governments to develop new digital radio standards that will "...Obtain maximum radio spectrum efficiency ... Ensure competition in system life cycle procurements ...Allow effective, efficient and reliable intra-agency and inter-agency communications ...(and) Provide user friendly equipment..."¹ Cycomm's interest and efforts have persuaded two international companies to participate in the work of Project 25 and in the FCC's Spectrum Refarming Roundtable discussions on March 1, 1993 and on May 6, 1993.

3. Cycomm is an active participant in the technical committees of the Telecommunications Industry Association (TIA). Also, senior management is heavily involved in

Project 25. Cycomm assisted in the development of the Intellectual Property Rights (IPR) agreements of Project 25, and is a signatory to the Project 25 IPR Memorandum of Understanding (MOU).

Flexibility is Essential to Users and Manufacturers

4. The statements in the Notice of Proposed Rule Making (NPRM) leave little doubt that an area of major concern is whether and to what extent the rules should provide the flexibility to adopt various channel bandwidths.² Cycomm agrees that flexibility to choose the bandwidth appropriate for the desired communications service is an important aspect not only for continued service but of the transition from the current technology to new technology. Perhaps the most important facet of

~~flexibility is the ability to adapt~~

5. Additionally, flexibility is important to relieve some of the spectrum congestion problems that currently exist in the major metropolitan areas. Not enough channels are available in the top 100 (or more) metropolitan areas to give each licensee an exclusive channel, irrespective of service area. The sharing of channels requires waiting for channel availability. Therefore, any technology that increases the number of independent communications paths benefits all parties in the improved conduct of their business. Such technologies should be implemented with as little administrative burden as possible.

6. Further, as telecommunications technology has evolved, more functions that previously required connection to the telephone network or a permanent location due to size and weight of the product can be incorporated into mobile and portable radio systems. It is now possible to incorporate full motion video, both transmission and reception, into vehicles. Remote monitoring can be life saving when a traffic officer stops a vehicle. High speed transmission of fingerprints, drawings and forms will permit public safety and business alike to have resources available to them at the mobile, and eventually at the portable, they do not now have. Again, the efficient conduct of

business dictates that such technologies should be adopted with as little administrative burden as possible.

Incentives will Improve Spectrum Efficiency Sooner

7. The FCC is proceeding in the right direction with a plan to foster the early adoption of more spectrum efficient technology. Licensee oriented incentives will

are also re channeled with 12.5 kHz offsets. In dense urban environments, therefore, there is little spectrum efficiency to be gained by half channel technology.

Spectrum Efficiency Is Not an Enemy Of Economic Efficiency

8. Cycomm agrees that new licensees should be required to adopt new technology as a cost for gaining access to the spectrum. This approach agrees with the FCC's often stated policy on interference. "Last in must fix the

implement technology that vastly increases the number of available communications paths. Spectrum efficient radio systems can be implemented on a much more leisurely basis, as needed, with the FCC in control when a problem arises.

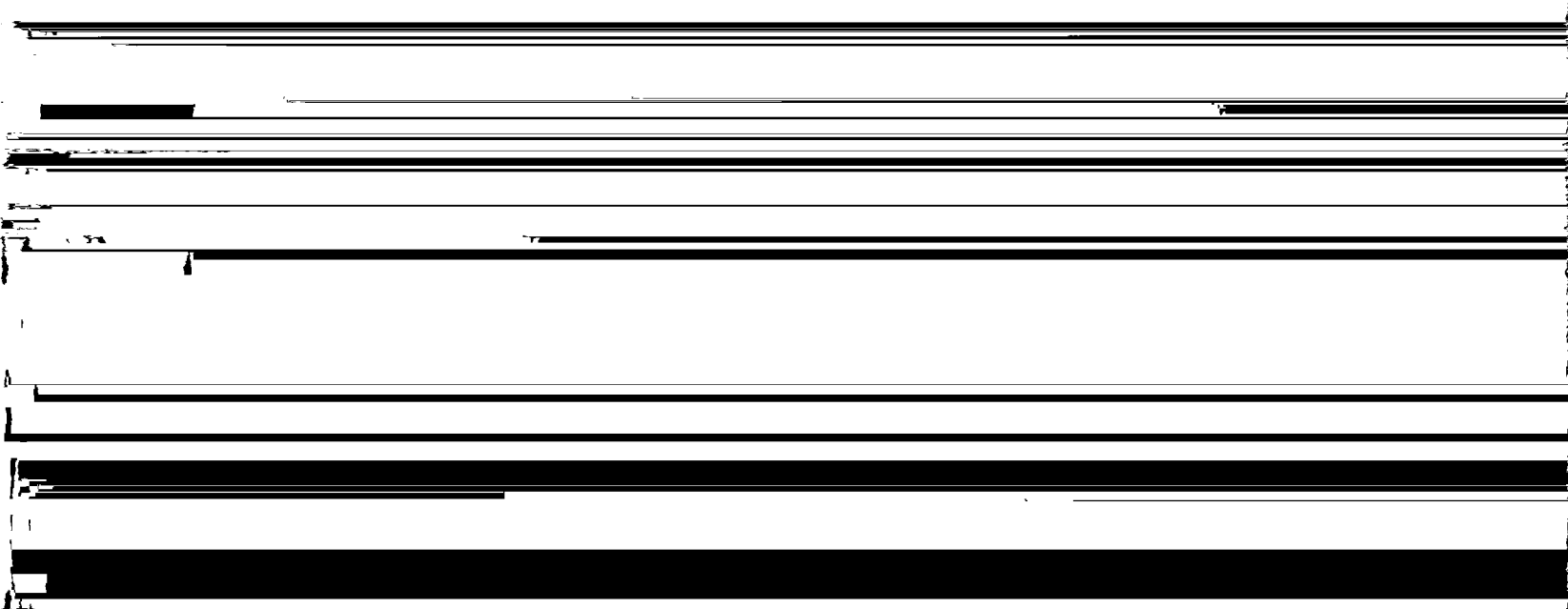
10. Cycomm notes that TIA has formed an Ad Hoc Committee on Spectrum Efficiency to study the related issues of communications capacity and spectrum efficiency. The committee has held two meetings and is considering the scope of its work and its charter. A member of Cycomm's senior management team chairs this committee. TIA has also formed a committee to study compatibility issues between different forms of technology and to identify cochannel and adjacent channel performance criteria. Cycomm also participates in the activities of this panel.

Some Users Need Spectrum Efficiency Now

11. As was emphasized by Mr. James Giannini, a member of the Pennsylvania Chapter of APCO, speaking at the March 1, 1993 FCC Brown Bag Luncheon, some users need highly spectrum efficient communications systems now. Mr. Giannini indicated he was ready to change out his system to very narrow bandwidth technology now! This unsolicited endorsement of the concept of very narrow band technologies for, presumably, a dense urban public

safety radio system should carry great weight in the FCC's deliberations.

12. Cycomm is aware that there are disbelievers in the availability of very narrow band technology, one of the more highly touted technologies to provide spectrum relief. At the May 6, 1993 FCC Roundtable on Spectrum Refarming six different vendors of five different technologies, each requiring 6.25 kHz of spectrum or less, were members of the panel. Two different technologies using a five kHz channel width are type accepted and two others are in the process of testing and obtaining type acceptance. Two technologies, Linear Modulation™ and ACSB™, have been extensively tested by government regulatory agencies and the reports are readily available.⁴ Although the five kHz technologies are currently configured for operation in the 220 MHz band, the redesign of current five kHz products to operate in the 150 MHz band is a relatively minor







Very Narrow Band Technology is Exportable

13. Several European countries as well as Canada are beginning to investigate whether very narrow band technologies such as linear modulation would provide higher quality, more flexible communications capability for their private mobile radio users. These countries will look to the US and the UK for guidance in the acceptability of this technology. The US has an opportunity to ease the balance of payments with the development of a full range of options for very narrow band radio systems and the provision of international sales

those in North and South America since the 1970's. US designs for 12.5 kHz FM equipment will not see a significant international market, and US manufacturers may lose domestic market share to foreign manufacturers whose designs and systems have been proven over the past 20 years. Additionally, the adoption of a 12.5 kHz channel plan sends the wrong message to other countries, and may further complicate negotiations within the International Telecommunications Union.

Very Narrow Band Radio Technology is Superior to 25 kHz or 12.5 kHz FM

16. Today's very narrow band single sideband technologies bear little resemblance to their predecessor. Today's improvements have overcome yesterday's limitations and today's sideband modulations



many factors, both operationally and from a spectrum management point of view. The reduction by 1/4th or 6 dB average power means that cochannel and adjacent channel stations can be located closer without harmful interference, increasing station density by almost 30%. Two signal third order intermodulation products can be reduced by as much as 18 dB, or 1/63 their FM value, making antenna site management much simpler and much less expensive. If the average power is less, the spurious emissions are less, decreasing the site noise at the receiver location, thus improving receiver response characteristics. Additionally, because the receiver has a narrower bandwidth to match the transmitter, less

radio system within the same frequency band by reprogramming. This attribute contributes significantly to the ease of transition between 25 kHz FM analog systems and systems with high spectrum efficiency.

Conclusions

19. Cycomm is extremely pleased to have the opportunity to comment on this landmark rule making. Technology is available today to provide a broad mix of solutions to user communications needs, to provide 5 times the available communications paths and to allow the FCC to manage the multiple bandwidths effectively.

Respectfully Submitted,



Richard L. McElhenie
Vice President
Cycomm Corporation
12150 Monument Drive
Suite 340
Fairfax, VA 22033

Appendix: A

APPENDIX A

END NOTES

CYCOMM CORPORATION

Docket No. 92-235

1. NEW TECHNOLOGY STANDARDS PROJECT, Advanced Technology Subcommittee, Digital Radio Technical Standards, APCO Project 25, August 13, 1992
2. NOTICE OF PROPOSED RULE MAKING adopted October 8, 1992, released November 6, 1992, 7 FCC Rcd 8105 (1992)
3. Informal decisions as well as formal ones have essentially reiterated this policy, both in shared private land mobile bands as well as in other services. WVEU vs. several SMR operators comes immediately to mind as an example of the policy.
4. Linear Modulation™ has been extensively evaluated by Kenley Laboratories, the UK equivalent of the FCC laboratories. ACSB™ was evaluated by the FCC laboratories in the early 1980's. Reports are available in limited quantity from the UK Department of Trade and Industry and from the FCC Office of Chief Engineer.